



**ENGINEERING OPERATIONS COMMITTEE
MEETING MINUTES
DECEMBER 4, 1997, 9:00 A.M.
UPTRAN CONFERENCE ROOM**

Present:	C. T. Maki	J. D. Culp	S. Bower (P. F. Miller)
	J. D. O'Doherty	E. Savas	J. W. Reincke
	T. Fort	E. D. Winkler	G. Etelamaki
Guest:	C. Bleech	D. L. Smiley	D. Phillips
	M. Frankhouse	T. Kratofil	T. Palmer

OLD BUSINESS

1. Approval of the Minutes of the November 6, 1997, Meeting - C. T. Maki

Minutes of the November 6, 1997, meeting were approved as written.

NEW BUSINESS

1. Research Report R-1353 - *Investigation of Calcium Hydroxide Depletion as a Cause of Concrete Pavement Deterioration* - J. W. Reincke/D. L. Smiley

The research investigated calcium hydroxide leaching as a cause of concrete pavement deterioration. Tests and procedures conducted by Robert Muethel showed that calcium hydroxide depletion increases concrete permeability and reduces the alkalinity of concrete, producing a corrosive environment.

Recommendations for remediation and repair of existing concrete include application of calcium hydroxide to restore alkalinity and the application of sealants to counteract leaching.

Recommendations for new concrete construction include the use of alternative cements and additives in concrete mixes to reduce permeability. The use of corrosion-resistant reinforcement is also a benefit.

Further research and investigations are now warranted.

ACTION: The research report is approved. The Research Laboratory will continue its investigative work as the project moves into its next phase.

2. **M-6 Concrete Pavement Design - P. F. Miller/S. Bower**

The Transportation Commission requested that the M-6 pavement selection be reanalyzed using the present Life Cycle Cost Analysis process. Updating the analysis resulted in the low cost pavement alternate switching to concrete, including two concrete alternates: Joint Plain Concrete Pavement and Jointed Reinforced Concrete Pavement (the department standard). Of the two concrete designs, the Jointed Plain Concrete alternate has a lower life cycle cost and is widely used by the other states in our region, especially Wisconsin and Minnesota, with excellent performance.

The Pavement Selection Review Committee and the Grand Region strongly support the Jointed Plain Concrete alternate for the entire M-6 corridor. The committee and the region also recommend that the 200 lane-mile limit, established by the EOC, be increased to 350.

DECISION: Approve the Jointed Plain Concrete alternate and include a state-of-the-art warranty. The requested increase to 350 lane-miles of Jointed Plain Concrete was also approved.

3. **Nomination for New Chairperson of the Pavement Selection Review Committee - G. Etelamaki**

Glen proposed that he step down as chair of the committee and nominated Steve Bower, Pavement Engineer, as his replacement.

ACTION: The EOC fully supported the nomination and Steve Bower will assume the chair role and responsibilities effective immediately.

4. **Pavement Type Selection (C.S. 25042, J. N. 36020C) I-69: M-13 to Elms Road, Bay Region - T. Palmer**

The project is in Genesee County on I-69 from M-13 to Elms Road, 9.59 km (5.96 miles). The proposed paved section will be two 3.6 m (12 ft±) lanes, a 3.0 m (10 ft±) outside shoulder, and a 1.2 m (4 ft±) inside shoulder.

Two reconstruction alternatives were presented.

DECISION: Approve the low cost alternate, Alternate 1, as follows:

Bituminous Overlay on Rubblized Concrete Pavement

50 mm (2"±)	Bituminous Mix 4E30 Top Course
64 mm (2.5"±)	Bituminous Mix 3E30 Leveling Course
108 mm (4.25"±)	Bituminous Mix 2E30 Base Course (Mainlines)

222 mm (8.75"±)	Bituminous Shoulders
229 mm (9")	Rubblized Jointed Reinf. Concrete Pavement
102 mm (4")	Existing Aggregate Base
300 mm (12")	Existing Sand Subbase - Add Underdrains

5. **Pavement Type Selection (C.S. 81076 [58033], J.N. 446603) US-23: Plank Road to South of Carpenter Road, University Region - T. Kratofil**

The project crosses from Washtenaw County into Monroe County and the city of Milan, 1.17 km (0.73 miles). The proposed paved section will be two 3.6 m (12 ft±) lanes, a 3.0 m (10 ft±) outside shoulder, and a 1.2 m (4 ft±) inside shoulder.

Three reconstruction alternates were presented.

DECISION: Approve the low cost alternate, Alternate 1, as follows:

Reconstruction With Jointed Plain Concrete Pavement

280 mm (11"±)	Non-Reinforced Concrete Pavement (5.0 m [16 ft±] Joint Spacing)
280 mm-200 mm (11"-8"±)	Tied, Non-Reinforced Concrete Shoulders (Tapered Design)
100 mm (4"±)	Open Graded Drainage Course
100 mm (4"±)	Aggregate Base Separator Course
300 mm (12"±)	Sand Subbase
100 mm (4")	Open Graded Underdrains

6. **Pavement Type Selection (C.S. 38061, J.N. 34106) M-60: Spring Arbor Road to I-94, University Region - T. Kratofil**

The freeway rehabilitation project is in Jackson County along the west urban area of the city of Jackson. It begins at the two lane section at Spring Arbor Road and continues northerly to I-94, 6.03 km (3.75 miles). The proposed paved section will be two 3.6 m (12 ft±) lanes, a 3.0 m (10 ft±) outside shoulder, and a 1.2 m (4 ft±) inside shoulder.

Three rehabilitation alternates were presented.

DECISION: Approve the low cost alternate, Alternate 3, as follows:

Bituminous Overlay on Rubblized Concrete Pavement

40 mm (1.5"±)	Bituminous Mixture - 4E3 (Top Course)
50 mm (2"±)	Bituminous Mixture - 3E3 (Leveling Course)
100 mm (4"±)	Bituminous Mixture - 2E3 (Base Course)
230 mm (9"±)	Rubblized Existing Jointed Reinforced Concrete Pavement
75 mm (3"±)	Existing Aggregate Base Course

300 mm (12"±) Existing Sand Subbase
460 mm (18") Proposed PDS Edge of Pavement Underdrains
190 mm (7½"±) Bituminous Shoulders

(Signed Copy on File at C&T/Secondary)

Jon W. Reincke, Secretary
Engineering Operations Committee

JWR:kat

cc: EOC Members
Region Engineers

J. R. DeSana	R. J. Risser, Jr. (MCPA)	T. Adams (MCA)	B. Richter
R. J. Lippert, Jr.	A. C. Milo (MRBA)	J. Ruszkowski	R. D. Till
D. L. Smiley	J. Becsey (MAPA)	C. Libiran	M. Frierson
M. Nystrom (AUC)	G. L. Mitchell	G. J. Bukoski	C. W. Whiteside
M. Newman (MAA)	J. Steele (FHWA)	K. Rothwell	